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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/679,080
Filing Date: October 04, 2003
Appellant(s): DITZEL ET AL.

David G. Maire
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed March 10, 2008 appealing from the Office action mailed October 09, 2007 and Advisory Action Mailed January 10, 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The amendment after final rejection filed on January 07, 2008 has not been entered.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is deficient. 37 CFR 41.37(c)(1)(v) requires the summary of claimed subject matter to include: (1) a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number, and to the drawing, if any, by reference characters and (2) for each independent claim involved in the appeal and for each dependent claim argued separately, every means plus function and step plus function as permitted by 35 U.S.C. 112, sixth paragraph, must be identified and the structure, material, or acts described in the specification as corresponding to each claimed function must be set forth with reference to the specification by page and line number, and to the drawing, if any, by reference characters. The brief is deficient because Appellant in the summary of claimed subject matter described the melting point depressant material comprising nickel-boron having a concentration C. This characterization of the melting point depressant is not accurately supported by the Appellant's own disclosure. In particular on page 1, 1 lines 21-31 of the specification specifically refers to the melting point depressant to include boron or silicon. There is no support of nickel-boron as a melting point depressant in the specification.

6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,700,881	Ryan	10-1987
6,060,174	Sabol et al.	05-2000
5,289,967	Bampton et al.	03-1994

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

For the purpose of appeal, the rejection of claim 1 under 35 USC 102(b) by the Patent to Cairo (US 6,098,871) is withdrawn from the final action.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-4 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1 and 2 contains a limitation "the melting point depressant material comprising nickel-boron". There is support for "melting

point depressant such as boron" in the disclosure; however there is no support for "the melting point depressant material **comprising nickel-boron".**

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how the limitation calling for "the melting point depressant material comprising nickel-boron" corresponds to the disclosed invention.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Ryan (US Patent No. 4,700,881).

Ryan teaches a transient liquid phase consumable insert comprising a sheath having Ni upper and lower layer, and a coating of a melting point depressant in the form of the metal boron on the surfaces of the nickel layers so as to be captured in the center in between the nickel layers; wherein a liquid zone occurs in the center; wherein the concentration of the boron is highest at the center portion of the consumable insert than other portions (column 1, lines 51-67, column 2, lines 29-36 and lines 40-46; column 2, line 59-column 3, line 30 and figure 4). It is noted that figure 4 describes an embodiment which show characteristic structural features which are functionally similar to the features set forth in claims 1-4. In particular figure 4 shows a consumable insert comprising a stack of foils made of nickel based material with boronized surface; wherein the stacking is made such that two boronized surfaces an interfaced forming a boron rich zone at the center or the composite foil surrounded by an immediate zone of the nickel based material. This immediate zone of nickel is interpreted by the examiner as nickel sheath based on the fact said Nickel material zone is both structurally and functionally similar and equivalent to the nickel sheath claimed.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 7-9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ryan (US Patent No. 4,700,881) in view of Sabol et al. (US Patent No. 6,060,174).

Ryan does not expressly teach MCrAlY alloy material as part of the consumable insert.

However Sabol et al. teaches transient liquid phase consumable insert made of MCrAlY alloy material and a boron temperature depressant for joining nickel based alloys to obtain a high quality joint at low cost (Sabol et al. abstract, column 1, lines 57-67; column 2, lines 7-15 and 32-48; and column 4, lines 3-58 and figure 1&2). Note regarding the mechanical properties of the insert, recited in claims 8 and 9, it is noted that the insert of Sabol et al. would posses the same or equivalent properties since it is made of the same material as claimed.

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to used MCrAlY alloy material in the consumable insert of Ryan as taught by Sabol et al. to obtain high quality joint at low cost (Sabol et al., column 1, lines 57-67).

9. Claims 15-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ryan (US Patent No. 4,700,881) in view of Bampton et al. (US Patent5 No. 5,289,967).

Ryan teaches a method of bonding with a transient liquid phase consumable insert comprising a sheath having Ni upper and lower layer, and a coating of a melting point depressant made of boron on the surfaces of the nickel layers so as to be captured in the center in between the nickel layers; wherein the concentration of the boron is highest at the center portion of the consumable insert than other portions (column 1, lines 51-67, column 2, lines 29-36 and lines 40-46; column 2, line 59-column 3, line 30 and figure 4); wherein the insert is disposed between two nickel or nickel based alloy workpieces and heated to a temperature sufficiently high to melt the insert for a time period sufficient for the melting point depressant to diffuse into the workpieces (column 2, lines 46-67). Ryan also teaches diffusion heat treatment. Note figures 2-4, of Ryan in figure 2, show a consumable insert which is rectangular-shaped, flattened and positioned between the workpieces. There is no suggestion in the specification as to the effect on the shape of the insert on the bonding process; furthermore the shape of the insert would inherently be determined by the form or shape of the two metal components being joined.

Ryan does not expressly teach applying a melting point depressant material in particle form.

However Bampton et al. teaches a method of bonding with a transient liquid phase consumable insert comprising melting point depressant material in a form of particles, powder, foil or coating (Bampton et al., column 1, lines 55-60, column 2, lines 1-17 and figures 1(A-C)).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to apply the melting point depressant material in a form of particles in the method of Ryan as taught by Bampton et al. since said application by particles is an obvious variation of coating which works equally well (Bampton et al., column 1, lines 55-60 and column 5, lines 49-53).

10. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ryan (US Patent No. 4,700,881) in view of Bampton et al. (US Patent5 No. 5,289,967) and Sabol et al. (US Patent No. 6,060,174).

Ryan and Bampton et al. do not expressly teach MCrAIY alloy material.

However Sabol et al. teaches transient liquid phase coating made of MCrAIY alloy material and a boron temperature depressant for joining nickel based alloys to obtain a high quality and joint at low cost

(Sabol et al. abstract, column 1, lines 57-67; column 2, lines 7-15 and 32-48; and column 4, lines 3-58 and figure 1&2). Note regarding the mechanical properties of the insert, recited in claims 8 and 9, it is noted that insert of Sabol et al. would posses the same or equivalent properties since they are of the same material as claimed.

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to used in the process of Ryan as modified by Bampton et al., a consumable insert comprising MCrAlY alloy material in view of the teachings of Sabol et al. to obtain high quality joint at low cost (Sabol et al., column 1, lines 57-67).

(10) Response to Argument

A. Appellant's first argument is that the claim 1 limitation of “melting point depressant material comprising nickel-boron" is not a new matter, that Page 4, lines 17-22 of the specification clearly describes an embodiment where a consumable insert is heated to encourage diffusion of boron melting point depressant into a nickel sheath material to form nickel-boron. Thus, the claim 1 limitation of a "melting point depressant material comprising nickel-boron" is fully supported in the specification, and the rejection under 35 USC 112, first paragraph should be reversed. The examiner disagrees. The specification as filed specifically states in page 4, lines 20-22 that “Such heat treatment may create a chemical bond between the sheath material 12 and some of the particles 14, such as forming nickel-boron for applications of a nickel sheath 12 and a boron melting point depressant 14”.

It is the examiner's position that, the statement above very clearly and distinctly characterizes boron as the only component constituting the melting point depressant. It is well known in the art to add boron to serve as a melting point depressant in nickel-base bonding alloy or filler. The Patents to Kear et al. (US 4,250,229), column 3, line 64-column 4, line 5); Allnatt (US 6,193,930), column 1, lines 10-20); Burke et al. (US 6,508,000), column 5, lines 27-35) in addition to the Patent to Ryan cited in the grounds of rejection are provided as evidence in support of the examiner's position.

B. Appellant second argument is that the limitation of "melting point depressant material comprising nickel-boron." Page 4, lines 1 7-22 of the specification clearly describes an embodiment where a consumable insert is heated to encourage diffusion of boron melting point depressant into a nickel sheath material to form nickel-boron. Accordingly, the claim 1 limitation of a "melting point depressant material comprising nickel-boron" can be fully understood in view of the specification, and claim 1 serves to particularly point out and distinctly claim the subject matter which the Appellant regards as the invention. Thus, the rejection under 35 USC 112, first paragraph should be reversed.

The Examiner disagrees. The specification distinctly characterizes boron as the only component constituting the melting point depressant, however claim I recites, "melting point depressant material comprising nickel-boron", it is the examiner’s position that in light of the specification said limitation lacks clarity and does not correspond to the disclosed invention.

D. Appellant also argues that Ryan describes the use of multiple foils (see column 1, line 53) wherein each foil has a boronized surface (column 2, fine 37); i.e. a higher concentration of boron near the surface of the foil than in the center of the foil. Thus, each individual foil of Ryan teaches away from the limitations of claims 1-4. However, even the stacked foils of Ryan do not anticipate claims I-4 because the concentration of boron in the stack is the same in the upper, middle and bottom regions. The Examiner has failed to appreciate that "concentration" is a measure of boron per unit volume. Each individual foil of Ryan has the same concentration of boron on its top and bottom surfaces, so when two foils arc stacked, the middle area still has the same "concentration" of boron, i.e. amount of boron per unit volume. While it is true that the two facing surfaces of the two stacked foils provide twice the "content" of boron (total molecules of boron), there is also twice the amount of metal (moral bottom of top foil, and metal top of bottom foil) so the concentration of boron per unit volume is the same in the middle of the stack as it is in the top and bottom regions. Thus, the rejections of claims 1-4 under 35 USC I02 are not supported by the art and should be reversed.

The examiner disagrees. In particular figure 4 shows a consumable insert comprising a stack of foils made of nickel based material with boronized surface; wherein the stacking is made such that two boronized surfaces are interfaced forming a boron rich zone at the center (column 2, lines 37-45). While the examiner understands that concentration among other forms can be express mass per unit volume, the specification does not describe said concentration quantitatively. The claim literally recites the concentration of boron at the center relative to other regions of the insert. Ryan in his disclosure in a similar manner assigns the concentration of boron to be greatest at the center than other portions of the composite foil. It is the examiner's position that both Appellant and Ryan describe the boron concentration qualitatively and that one of ordinary skill in the art would understand and assign literal meaning to said concentration as set forth in the claim.

E. Appellant also argues that Ryan describes a consumable insert but lacks any teaching of the use of MCrA1Y material. Sabol describes a protective coating of MCrA1Y material deposited on a metal substrate wherein particles of boron in the MCrAlY material allow the coating to condense to form a more densified coating. (Sabol column 3, lines 55-58). The Examiner states that it would have been obvious to use the MCrAlY material of Sabol in the insert of Ryan, thereby rejecting claims 7-9 and 12 trader 35 USC 103. However, the Examiner errs in his interpretation of the teaching of Sabol and he has failed to establish a prima facie case for obviousness. The applicant's characterization of the examiner's position is noted , however in the 10th paragraph of the final office action the examiners intends to refer to the MCrAlY alloy material as a coating utilized in joining materials based on nickel and or nickel alloys and for enhancing the integrity of the bond.

The examiner agrees that Sabol does not teach consumable insert, however Sabol teaches the application of MCrAlY alloy coating for joining materials based on nickel and or nickel alloys. Sabol provides MCrAlY alloy for enhancing the integrity of the bonds formed . The examiner believes that the teaching of Sabol is relevant to the subject matter of the instant claimed invention, because though the claims recite "particles of MCrAlY" , the specification characterizes the MCrAlY alloy as powder deposit or coating (Specification, page 5, lines 14 and 27) similar to the designation of said alloy in Sabol's disclosure. Furthermore said MCrAlY alloy is added to the insert of the claimed consumable insert to enhance the mechanical properties of a bond between components made of nickel or nickel based material. Against this background, the examiner believes that one of ordinary skill in the art seeking to improve the mechanical properties of the bonds formed in the process of Ryan (bonding components comprising nickel or nickel based material) would look at the teaching of Sabol to add MCrAlY coating to the components or members to be joined.

F. With respect to section F, The Appellant argues that the combination of Ryan and Bampton et al. fails to provide prima facie support for the rejection of any of claims 15-21 because the combination lacks essential elements of each of these claims.

It is noted that the essential features argued by the Appellant in this section have already being discussed in section A,B,D and E, besides said features do not apply to Bampton et al. Bampton et al. references as in the grounds of rejection above, is applied only to show various commonly used structural forms of melting point depressant material, such as particles, powder, foil or coating.

Applicant further in this section characterized the Examiner to be confusing the insert forming step with the shaping of the insert.

It is noted that the mechanical processing step such as the flattening of the insert was considered by the Examiner in the examination process, however the examiner believes that said shape or shaping of the insert provides no contribution to the diffusion process which seems to be the central issue governing the claimed bonding process. It is believe that, the heat treatment and the chemical composition of the insert are rather the essential components or parameters that drive the process. The examiner also could not find any evidence in the specification showing that said shaping or shape of the insert is critical to the claimed invention. The examiner assigns fairly minimal patentable weight to either the shape or shaping of the insert.

G. The arguments raised in section G is basically drawn to claim 22, however claim 22 is substantially similar to claim 7 plus other independent claims or other features already covered in Section A,B,D and E.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejection should be sustained.

Respectfully submitted,

/Michael Aboagye/

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Art Unit 1793

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